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In the Drawings:

The Applicant hereby submits one Replacement Sheet including Figure 4 in place of the original missing drawing sheet including the same Figure.

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REMARKS**Introductory Comments:**

Claims 1-20 are pending in the application. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Duensing (US 200310020476). Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nabetani (US 6,618,610), and further in view of Duensing (US 2003/0020476). Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Duensing (US 2003/0020476) as applied to claim 1 above, and further in view Yamashita et al (US 6,556,012). Claims 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over of Duensing (US 2003/0020476) as applied to claim 1 above, and further in view Bogdanov et al; Magnetic Resonance in Medicine 47: 579-593 (2002). Claims 13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nabetani (US 6,618,610) as applied to claims 12 and 14 above, in view of Duensing (US 2003/0020476), and further in view of Bogdanov et al; Magnetic Resonance in Medicine 47: 579-593 (2002).

In Response To The Missing Figure:

According to the Office Action, Figure 4 is missing from the application file, and the Applicant is requested to provide a copy of the Figure. In response, the Applicant submits one Replacement Sheet including Figure 4 in place of the original missing drawing sheet including the same Figure. Applicants note that the Application as originally filed included a full description of Figure 4 such that one skilled in the art would be able to construct the illustrated diagram absent the Figure. No new matter is included in the Figure.

In Response To The 102(e) Claim Rejections:

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As regards to claim 1, Duensing teaches an MRI system including a scanning unit adapted to generate a parallel scan (paragraphs 2, 6, 23 and 37), including a substantially cylindrical member defining a scanning bore, and a RF coil assembly mounted in the scanning bore (paragraph 2), wherein the RF coil assembly comprises a TEM surface resonator array (paragraph 22).

In response to this rejection, claim 1 is amended to include a static magnet structure comprising a superconducting magnet having a plurality of superconducting magnetic field coils adapted to generate a temporally constant magnetic field along a longitudinal axis of said scanning bore. This amendment includes the limitations of claim 2, and claim 2 is cancelled. No new matter has been added. Therefore, as recognized by the Office Action, because the claims and the prior art differ, this rejection is believed to be overcome. Claims 3-11 depend from the amended claim 1 and are believed to be allowable for at least the aforementioned reason.

In Response To The 103 (a) Claim Rejections:

As regards to claims 12 and 14, the Office Action alleges that Nabetani teaches a MRI system and a method, including a scanning unit adapted to generate a scan (figure 6), wherein a substantially cylindrical member defining a scanning bore, and having a RF coil comprising a TEM surface resonator, which is adapted to generate and receive an image signal (figure 6; column 1, lines 5-26; column 2, lines 38-65). The Office Action recognizes that Nabetani does not teach a scan unit adapted to generate parallel scan or imaging.

According to the Office Action, Duensing teaches a scan unit adapted to generate parallel scan or imaging (paragraphs 6, 23 and 37).

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"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1672, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Even if all the elements of Applicant's invention are disclosed in various prior art references, which they are not, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill would have been prompted to combine the teachings of the references to arrive at the claimed invention. Therefore, because no teaching or suggestion is found in any of the references for parallel scanning using a TEM surface resonator, the claims are believed to be allowable.

The Applicant submits that it would not have been obvious to combine the Nabetani and Duensing references to arrive at the present invention. No reason is shown why one of ordinary skill in the art would modify the Nabetani and Duensing references as the Office Action proposes. The references are not pertinent to the problem of prior art requiring TEM resonator using quarter wave sections for allowing MRI designers to tailor resonator geometry for optimal coverage of the patient to be imaged, as are the claims. Applicant's design is unique in that it includes parallel scanning using an RF coil having a TEM surface resonator within a cylindrical scanning bore.

The Nabetani reference is directed to a method and apparatus for MRI scanning (Abstract.), as is typical for the field of medical imaging. More importantly, however, Nabetani does not disclose or teach parallel imaging, as recited in the claims. Instead, the Nabetani system is conventional in that it includes generating and receiving image signals, and Nabetani does not disclose or suggest a system for parallel scanning.

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The Duensing reference is directed to a conventional method for MRI imaging. Duensing, however, does not disclose or teach parallel scanning may be used with or would be beneficial to combine with a TEM surface resonator, as claimed by the Applicant. Instead, Duensing teaches typical parallel scanning including the limitations found therethrough such that a TEM surface resonator is not practicable (in fact page 3, Paragraph [0036] of Duensing discusses TEM-like coils, recognizing that a TEM surface resonator, would not be applicable with Duensing.). It would not, therefore, have been obvious to modify Duensing as the Office Action proposes.

The Nabetani and Duensing references are directed to divergent fields of art. More importantly, neither of these references discloses or teaches parallel scanning using a TEM surface resonator. Further, no reason has been shown why it would be obvious to selectively combine these references to produce the claimed invention. Applicant therefore submits that no motivation has been shown to combine the references as proposed and that the references do not teach or disclose the claimed invention.

Benefits of claims 14 and 16 include shortening of the scanning time and improved image quality, as recognized by the Office Action. As it is a constant goal to improve image quality for MRI scanning, recognizing that the present invention achieves this goal highlights the non-obvious nature of the present invention. The Office Action seems to be engaging in an improper use of hindsight, i.e. as the results are favorable, one skilled in the art would naturally have seen the present invention as obvious at the time it was invented.

Whether the teachings of the prior art suggest to or motivate one of skill in the art to combine the references is a critical element in the obviousness inquiry. *See, e.g.,*

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Carella v. Starlight Archery & Pro Line Co., 804 F.2d 135, 140, 231 USPQ 644, 647 (Fed.Cir.1986) (holding that obviousness cannot be established by combining the teachings of the prior art without a suggestion to combine the references). "This showing must be unequivocal, and cannot rest on broad conclusory statements about what the prior art suggests to one of ordinary skill in the art." *American Imaging Services, Inc. v. Intergraph Corp.*, 250 F.3d 757, 2000 WL 772725, 6 (Fed. Cir. 2000). "Otherwise, the obviousness determination is vulnerable to the improper use of hindsight." *Id.* Therefore, claims 14 and 16 are believed to be allowable because one skilled in the art would not have been motivated by the prior art references to produce the present invention.

Claim 2 is cancelled, however, the limitations of claim 2 are included in the amended claim 1, and therefore, the rejections thereof will be addressed. As regards to claim 2, the Office Action recognizes that Duensing further fails to teach superconducting magnetic structure to create constant magnetic field in an MRI system. According to the Office Action, Yamashita et al teach superconducting magnetic structure to create constant magnetic field in an MRI system. (column 4, lines 36-48.)

The Office Action recognizes that claim 2 provides increase magnetic field strength without heat loss and dissipation, improving image quality. As discussed above, these are constant goals of imaging technology. The fact that the claims provide an improved design over the prior art does not suggest that the claims would have been obvious and conversely suggests the opposite. As discussed above, Duensing is directed to a typical parallel imaging system and provides no teaching or suggestion for the proposed combination. Further, Yamashita is drawn to a typical

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MRI apparatus, with limitations found in the prior art making the claimed system heretofore impracticable (such as requiring quarter wave elements and associated geometric constraints for scanning). Therefore, because no teaching or suggestion is found in the prior art either alone or in combination, and because the present invention overcomes limitations of the prior art, the amended claim 1 is believed to be allowable.

As regards to claims 3-11, the Office Action recognizes that Duensing does not further teach limitations expressed in these claims. According to the Office Action, they are taught by Bogdanov et al teach (figures 1-3). The Office Action also recognizes that the limitations of claims 3-11 improve image quality over any one of the references. The Office Action alleges, however, that Bogdanov et al teach (figures 1-3) these limitations. As discussed earlier, the prior art references are not directed towards parallel imaging using a TEM surface array mounted in a scanning bore. Bogdanov does not teach or suggest that the described TEM resonator is in any way applicable to parallel scanning. Benefits of the claims include that relatively poor circuit coupling (-10dB between near neighbor elements) is tolerable and will generate useable image reconstructions in parallel imaging. Previously, this was not possible, as combining a TEM array as described in Bogdanov with an MRI system resulted in requirements for quarter wave elements and the geometric constraints they required. The mere fact that combining the prior art may have all the elements of a claim does not render that claim obvious. Bogdanov does not disclose or suggest the rod configuration of claim 3, which solves problems that previously prevented parallel imaging as claimed. Nabetani although including rods does not suggest that this may be in any way applicable to TEM arrays as the Office Action suggests. Therefore,

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because there is no teaching or suggestion in the prior art references for the combination of claims 3-11, these claims are believed to be allowable.

As regards to claims 13 and 15-20, the Office Action recognizes that Nabetani and Duensing do not teach limitations of these claims. Further, claims 13 and 15-20 depend from claims 12 and 14 and are believed to be allowable for at least this reason.


Conclusion:

In view of the aforementioned remarks, it is respectfully submitted that all pending claims are in a condition for allowance. A notice of allowability is therefore respectfully solicited. Please charge any fees required in the filing of this amendment to Deposit Account 07-0845.

The Examiner is invited to contact the undersigned at (248) 223-9500 if any unresolved matters remain.

Respectfully Submitted,

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